

## INTERNATIONAL SEARCH REPORT

Int'l Application No  
PCT/IB2004/052856

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 H04R3/02

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04M H04R H04S

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 323 458 A (PARK ET AL) 21 June 1994 (1994-06-21)	1,3,4,6, 7,10
Y	column 1, line 11 - line 40 column 2, line 29 - column 4, line 4 figures 1-3,5,6	2,5,8,9
Y	WO 03/010996 A (KONINKLIJKE PHILIPS ELECTRONICS N.V; JANSE, CORNELIS, P; BELT, HARM, J) 6 February 2003 (2003-02-06) page 4, line 24 - page 6, line 4 page 8, line 4 - page 9, line 6	2,9
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

\* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
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- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*G\* document member of the same patent family

Date of the actual completion of the international search

1 March 2005

Date of mailing of the international search report

09/03/2005

Name and mailing address of the ISA

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PC 1, IB2004/052856

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	<p>CHANGKYU CHOI ET AL: "Speech enhancement and recognition using circular microphone array for service robots"</p> <p>PROCEEDINGS OF THE 2003 IEEE/RSJ INTERNATIONAL CONFERENCE ON INTELLIGENT ROBOTS AND SYSTEMS. (IROS 2003). LAS VEGAS, NV, OCT. 27 - 31, 2003, IEEE/RSJ INTERNATIONAL CONFERENCE ON INTELLIGENT ROBOTS AND SYSTEMS, NEW YORK, NY : IEEE, US,</p> <p>vol. VOL. 4 OF 4,</p> <p>27 October 2003 (2003-10-27), pages 3516-3521, XP010671386</p> <p>ISBN: 0-7803-7860-1</p> <p>page 3516, column 2, paragraph 3</p> <p>page 3517, column 1, paragraph 2 - page 3518, column 1, paragraph 2</p> <p>page 3519, column 2, paragraph 3</p> <p>-----</p>	5
Y	<p>US 6 570 985 B1 (ROMESBURG ERIC DOUGLAS)</p> <p>27 May 2003 (2003-05-27)</p> <p>column 3, line 23 - column 4, line 41</p> <p>-----</p>	8
A	<p>US 6 269 161 B1 (MCLAUGHLIN HUGH J ET AL)</p> <p>31 July 2001 (2001-07-31)</p> <p>column 1, line 6 - column 2, line 26</p> <p>column 9, line 39 - line 56</p> <p>-----</p>	1
A	<p>HOSHUYAMA O ET AL: "A ROBUST ADAPTIVE BEAMFORMER FOR MICROPHONE ARRAYS WITH A BLOCKING MATRIX USING CONSTRAINED ADAPTIVE FILTERS"</p> <p>IEEE TRANSACTIONS ON SIGNAL PROCESSING, IEEE, INC. NEW YORK, US,</p> <p>vol. 47, no. 10, October 1999 (1999-10), pages 2677-2684, XP000947154</p> <p>ISSN: 1053-587X</p> <p>figures 1,2</p> <p>-----</p>	1

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